8 GLOSSARY

100-year floodplain: Lowlands bordering a river that would be flooded, on average, once in every 100 years.

Accelerator: A device (i.e., machine) used to produce high-energy, high-speed beams of charged particles, such as electrons, protons, or heavy ions, for research in high-energy and nuclear physics, synchrotron radiation research, medical therapies, and some industrial applications.

Activation: The process of making a radioisotope by bombarding a stable element with neutrons or protons. For example, when elements in air are exposed to radiation (irradiated), they can be changed into unstable isotopes (e.g., carbon-11, oxygen-15, nitrogen-13).

Activation product: A radionuclide produced by activation (see "activation," above).

Aquifer: A geologic formation that can yield significant quantities of groundwater to wells or springs.

Bench-scale studies: Very small-scale studies carried out in a laboratory, typically conducted prior to field-scale or pilot-scale studies.

Bending magnet: Bending magnets deflect the electrons in the accelerator into a circular path so that they follow a closed loop.

BioCARS: The structural biology group of the Consortium for Advanced Radiation Sources (managed by the University of Chicago Center for Advanced Radiation Sources), formed to foster frontier research in the field of macromolecular crystallography.

Biohazard: A hazard that is posed to humans by a biological organism, or by a material produced by such an organism.

Biosafety cabinet: A ventilated cabinet that is the primary containment device for operations involving biohazard materials.

Biosafety Level-3: Biosafety levels are specific combinations of work practices, safety equipment, and facilities that are designed to minimize the exposure of workers and the environment to infectious agents. Biosafety Level-3 applies to agents that may be transmitted by the respiratory route, which can cause serious infection. Biosafety levels are defined by the Centers for Disease Control and Prevention (CDC).

Bioswales: A vegetated catch basin or drainage channel that moves water as slowly as possible so that runoff is filtered by contact with vegetation and infiltration is maximized.

Biota: The living organisms in a given region.

Blowdown water: Water removed from an evaporative system (e.g., cooling tower or boiler) to reduce mineral concentrations that can cause scaling.

Booster synchrotron: A piece of equipment that accelerates the electron beam to high energy before the beam is injected into the storage ring.

Chemical self-assembly: In chemical solutions, self-assembly (also called Brownian assembly) results from the random motion of molecules and the affinity of their binding sites for one another. Also refers to the joining of complementary surfaces in nanomolecular interaction.

Chillers: Cooling equipment

Cleanroom: A specially constructed enclosed area environmentally controlled with respect to at least one or more of the following parameters: particulate, temperature, humidity, air pressure, velocity and directionality of airflow, vibration, noise, viable particulate, and lighting.

Corrosives: Materials that cause visible destruction of, or irreversible alterations in, animal or human skin tissues at the site of contact.

Criteria air pollutants: Common air pollutants for which National Ambient Air Quality Standards have been established. They include sulfur dioxide, nitrogen oxides, carbon monoxide, ozone, particulate matter, and lead.

Cryogenic temperature: Producing, or related, to the production of extremely low temperatures.

Cumulative impacts: Potential impacts when the Proposed Action is added to other past, present, and reasonably foreseeable future actions.

de minimis: Certain quantities of pollutants that are legally defined as to be small enough to be exempt from environmental regulations.

Dermal absorption: Entry of a substance into the body through the skin.

Dolomite: Calcium magnesium carbonate, a common rock-forming mineral. Many rocks referred to as limestone are actually dolomite.

Effluent: A gas or fluid discharged into the environment. The term usually applies to wastewater discharged from a point source (such as a pipe) to surface waters.

Endangered Species: Any plant or animal species that is likely to become extinct within the foreseeable future throughout all or a significant portion of its range.

Exfoliating bark: Bark that peels off in thin layers.

Exotic: A species that is not native to a given area.

Forb: Herbaceous plant other than those in the Gramineae (true grasses), Cyperaceae (sedges), and Juncaceae (rushes) families, that is, any nongrass-like plant having little or no woody material.

Fugitive emissions: Emissions (air pollutants) released to the air other than from stacks or vents. They are often due to equipment leaks, evaporative processes, and windblown disturbances.

Glacial till: Material (e.g., sand, pebbles, and boulders) deposited by a glacier.

Glaciation: The formation, movement, and recession of glaciers and ice sheets. Glaciation is a collective term describing all the geological processes associated with glacial activity.

Glacial drift: A load of rock material transported and deposited by a glacier. Glacial drift is usually deposited when the glacier begins to melt.

Glacial loading: Deformation of the earth's crust by the weight of glaciers.

Hazardous waste: According to the Resource Conservation and Recovery Act (RCRA), a waste that because of its characteristics may (1) cause or significantly contribute to an increase in serious irreversible illness, or (2) pose a substantial hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed. Hazardous waste possesses at least one of the following characteristics: ignitability, corrosivity, reactivity, or toxicity. Hazardous waste is not radioactive.

Hazardous material: Any substance capable of causing harm to people, animals, or the environment.

Heavy metal compound: A compound that contains heavy metals. Heavy metals are metallic elements of high molecular weight, such as mercury, chromium, cadmium, lead, and arsenic, that are toxic to plants and animals at known concentrations.

Herbaceous vegetation: Pertaining to plants with a nonwoody stem that die back in winter in the temperate zone.

High-throughput computational facility: A facility that delivers large amounts of computing capacity to its users over long periods of time by pooling available computing resources on the network.

Hydrologic: Pertaining to hydrology, the applied science concerned with the waters of the earth.

Indigenous: A species that occurs naturally in an area; native.

Infrastructure: The basic facilities, services, and utilities needed for the functions of an industrial facility or site. Transportation, water supply, and electrical systems are part of the infrastructure.

Inhalation: Breathing. Material that is inhaled enters the lungs.

Insertion devices: Periodic arrays of magnet structures that are placed in the straight sections of the storage rings.

Invasive species: Native or non-native species that threaten ecosystems or habitats by displacing native species that are components of stable ecosystems or habitats.

Isostatic adjustments: Changes in land elevation caused by the buoyancy of the earth's crust (see also "glacial loading and unloading.")

Latent cancer: A cancer that becomes active following a latent period (i.e., a period of inactivity).

Linear acceleration/accelerator (LINAC): A long straight tube in which particles (mostly electrons or protons) are accelerated by electrostatic fields or electromagnetic waves and thus achieve very high energies.

Listed species: Species that are designated as threatened or endangered.

Lithography: In semiconductor science, it is a process used to transfer a pattern from a mask or reticule to a layer of resist deposited on a wafer.

Low-level radioactive waste: Waste that contains radioactivity and is not classified as high-level waste, transuranic waste, or spent nuclear fuel.

Low-level mixed waste: Waste that contains both hazardous and low-level radioactive waste.

Maximally exposed individual: A hypothetical person who because of proximity, activities, or living habits could receive the highest possible dose of radiation or of a hazardous chemical from a given event or process.

Maximum credible incidence: The most serious incident that could be expected from the range of hazards.

Metrology: The science of measurement.

Mitigation: A series of actions implemented to ensure that projected impacts will result in no net loss of habitat value or wildlife populations.

Nanoscale: 1 to 100 billionths of a meter.

Nanoscience: The extension of existing sciences into the nanoscale level.

Neutron: An uncharged elementary particle with a mass slightly greater than that of the proton, and found in the nucleus of every atom heavier than hydrogen.

Nitrogen oxides (NO_x): The oxides of nitrogen, primarily nitrogen oxide and nitrogen dioxide, that are produced in the combustion of fossil fuels. Nitrogen oxides are criteria air pollutants.

Off-normal conditions: Abnormal or unplanned events or conditions.

Old field: An area that was formerly cultivated or grazed and where woody vegetation has begun to invade.

Order of magnitude: An amount equal to ten times a given value. If some quantity was ten times as great as another quantity, it would be an order of magnitude greater; if one hundred times as great, it would be larger by two orders of magnitude.

Outfall: The discharge point of a drain, sewer, or pipe into a body of water.

Oxidizers: Substances that give up oxygen readily to stimulate the combustion of organic matter.

Particulate matter: Fine liquid or solid particles, such as dust, smoke, mist, or fumes, found in air emissions. The size of the particulates is measured in micrometers (0.000039 inch). PM_{10} (particulate matter with an aerodynamic diameter equal to or less than 10 micrometers) and $PM_{2.5}$ (particulate matter with an aerodynamic diameter equal to or less than 2.5 micrometers) are criteria air pollutants.

Particulates: Liquid or solid particles, such as dust, soot, mist, or smog, that are small enough to become airborne.

Penetrating radiation: Radiation that is able to penetrate many materials, including the human body. Gamma rays, beta particles, and neutrons are types of penetrating radiation.

Photons: A particle of light. The name given to a small bundle or quantum of electromagnetic energy.

Radionuclide: A radioactive atom or atoms.

Reactives: Materials that have a tendency to undergo chemical reaction with the release of energy. Undesirable effects, such as pressure buildup, temperature increase, or formation of toxic by-products may occur, because of the reactivity of a substance to heating, burning, direct contact with other material, or other conditions found in use or in storage.

Riparian: Relating to, living in, or located on the bank of a river, lake, or tidewater.

Sedges: Perennial nonwoody plants common to most freshwater. Sedges resemble grasses.

Sedimentation: The removal, transport, and deposition of sediment particles by wind or water.

Seismic: Pertaining to any earth vibration, especially that of an earthquake.

Select Agents: Biological agents of human disease whose transfer or receipt requires a facility to be registered with the CDC under 42 CFR Part 72.6. Select agents have historically been associated with weapons production efforts and thereby require a heightened level of security.

Silt: A sedimentary material consisting of fine mineral particles intermediate in size between sand and clay.

Skyshine: Ionizing radiation that escapes skyward through roof shielding and reflects or shines back toward the ground some distance from the source.

Storage ring: A device, associated with an accelerator, that stores the accelerated electrons in a circular orbit at a particular speed. To achieve nuclear reaction, the electrons are directed against particle groups orbiting in the reverse direction.

Synchrotron: A machine that accelerates and guides charged particles, such as electrons, into an orbit. As the electrons round each bend in the accelerator ring, they are guided by powerful magnets and give off energy in the form of light. This is called “synchrotron light.”

Synchrotron radiation/synchrotron light: The radiation emitted by charged particles being accelerated in magnetic fields and moving at speeds near that of light. Synchrotron radiation is another term for synchrotron light, the broad spectrum of light produced by a synchrotron. It ranges from infrared light to visible light, to X-rays.

Tectonic: Concerning changes in the structure of the earth’s crust or the forces that cause such changes.

Terrestrial: Living or growing on land rather than in water or air.

Threatened species: Any plant or animal species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Transformer: A device that transfers electrical energy from one electric circuit to another, without changing the frequency. The energy transfer usually takes place with a change of voltage.

Transuranic waste (TRUW): Radioactive waste that contains more than 100 nanocuries per gram of alpha-emitting isotopes with atomic numbers greater than 92 and half-lives greater than 20 years.

Undulator: A device that moves the beam of light in the storage ring by about a micrometer.

Wet chemical processing: Laboratory procedures that use liquid chemical solutions (wet) rather than, or in addition to, laboratory instruments.

Wetland seeps: In wetlands, seeps are land that oozes water.

X-ray: A high-energy electromagnetic radiation. It has a wavelength between 0.01 and 100 nanometers, which is between gamma rays and ultraviolet light, and can penetrate solids and ionized gas.